COLORADO FACILITY SPECIFIC HEALTH CARE-ACQUIRED INFECTION DATA - SURGICAL SITE INFECTION OVERVIEW

Surgical site infections (SSI) are infections directly related to a surgical procedure. It is estimated that more than 20 percent of HAI are attributed to SSI, equating to infections in approximately two percent of all surgical procedures nationally.⁵ The impact from an SSI can be devastating, often leading to a longer hospital stay, additional treatment and higher costs.⁶ The economic toll per patient occurrence is estimated to be between \$3,000 and \$25,500 depending on the procedure and pathogen(s) involved.^{1,7} Overall in the United States, SSI can cost consumers and health care payers from 3 to 10 billion dollars each year.¹

Surgical procedures required for SSI reporting are selected because they are (1) performed at a high volume, (2) performed at a variety of facilities, and (3) associated with a high risk for SSI. The surgeries monitored for SSI in Colorado include cardiac procedures, hip and knee replacements, hernia repairs, hysterectomies (abdominal and vaginal), and breast and colon procedures. The NHSN manual defines reportable procedures for surveillance as those that occur in a single trip to an operating room where the incision is closed following the procedure. Surgeries are performed as either inpatient or outpatient procedures.

Reportable infections occur within 30 days of the procedure or within one year if an implant was placed during the procedure. Common signs of infection include fever, pain or tenderness, drainage from the incision site, redness, or presence of an abscess. In NHSN, SSI are classified into three different categories based on the location of the infection.

- Superficial incision infection, which involves only the top layers of the skin.
- Deep incision, which involves deeper soft tissues (e.g., fascia and muscle layers).
- Organ space, which involves any part of the body that is opened or manipulated during the surgical procedure, excluding the top layers of skin, fascia or muscle layers.

Every table presenting SSI data below lists each facility in Colorado that performed the designated procedure, its city, the number of procedures performed, number of infections, standardized infection ratio (SIR) and a comparison to national infection data. For a detailed explanation of how the SIR is calculated, see Appendix B. There are three categories that indicate how a facility's own infection rate compares to the national infection rate. These are:

- 1. Statistically fewer (better) infections than expected based on national infection rates;
- 2. Statistically similar (same) infections as expected based on the national infection rates; or
- 3. Statistically more (worse) infections than expected based on national infection rates

ORTHOPEDIC PROCEDURES

Background

A total or partial hip replacement is a surgery for people with severe hip damage or pain related to chronic osteoarthritis, rheumatoid arthritis, or other degenerative processes involving the hip joint. The surgical procedure for a hip replacement (HR) involves removing the damaged cartilage and bone from the hip joint and replacing them with an artificial device. The procedure consists of placing a cup, which is typically plastic, ceramic or metal, to replace the hip socket, a metal or ceramic ball to replace the head of the thighbone, and a metal stem to attach to the bone.

A total or partial knee replacement (KR) is a surgery for people with severe knee damage and pain related to osteoarthritis, rheumatoid arthritis or traumatic arthritis. A total knee replacement involves removing the damaged cartilage and bone from the surface of the knee joint and replacing them with an artificial device. In this procedure, the patella (kneecap) is removed, the femur (thigh bone) and tibia (shin bone) are cut down, and a metal, ceramic or plastic prosthesis is put in place.

Fifty-eight hospitals reported 8,337 HR procedures this past year. One hospital had a HR SSI rate worse than the national average; all other hospitals had HR SSI rates similar to the national average.

Results

Tables 9 and 10 show facility specific data for SSI attributed to hip and knee procedures performed in hospitals (inpatient and outpatient) and ASC (outpatient only) from Aug. 1, 2012 through July 31, 2013. Historical data for

(outpatient only) from Aug. 1, 2012 through July 31, 2013. Historical data for two previous reporting years are also provided.

Fifty-eight hospitals reported 8,337 HR procedures this past year, 12 of which reported zero HR SSI. One hospital had a HR SSI rate worse than the national average; all other hospitals had HR SSI rates similar to the national average.

Only one ASC reported HR procedures this past year. Of 200 HR procedures performed at that ASC, zero infections were reported.

Fifty-eight hospitals reported 12,234 KR procedures this past year; 21 reported zero KR SSI. One hospital had a KP SSI rate better than the national average and one hospital's rate was worse.

Fifty-eight hospitals reported 12,234 KR procedures this past year; 21 reported zero KR SSI. One hospital had a KR SSI rate better than the national average, one hospital's rate was worse, and all others were similar to the national average.

Three ASC reported 469 KR procedures this year, all three of which reported zero infections.

Table 9: Hip Replacement (Total or Partial) in Hospitals and Ambulatory Surgery Centers (ASC), Aug 1, 2010 – July 31, 2013

| | Surgical Site I | nfections in Hi | ip Replaceme | nt Proce | edures in Hospit | als and Ambul | atory Surgery | Centers | Aug. 1, 2010 – | luly 31, 2013 | | | |
|---|------------------------|--------------------|--------------------|----------|------------------------|--------------------|--------------------|------------------------|------------------------|--------------------|---------------------|-----|----------------------------|
| | August 2010- July 2011 | | | | | August 2011- | 2 | August 2012- July 2013 | | | | | |
| Health Facility and City | | Procedure Count | Infection Count | SIR | National Comparison | Procedure Count | Infection Count | SIR | National Comparison | Procedure Count | Infectio n Count | SIR | National Compariso n |
| Animas Surgical Hospital | Durango | 47 | 0 | 0 | Same | 47 | 0 | 0 | Same | 70 | 0 | 0 | Same |
| Arkansas Valley Regional MC | La Junta | 12 | *** | *** | *** | 18 | *** | *** | *** | 11 | *** | *** | *** |
| Aspen Valley Hospital | Aspen | 3 | *** | *** | *** | 9 | *** | *** | *** | 50 | 0 | 0 | Same |
| Boulder Community Hospital | Boulder | 350 | 2 | 0.6 | Same | 321 | 4 | 1.3 | Same | 242 | 1 | 0.4 | Same |
| Centura Avista Adventist Hospital | Louisville | 126 | 3 | 2.6 | Same | 113 | 1 | 1.0 | Same | 99 | 4 | 4.0 | Worse |
| Centura Littleton Adventist Hospital | Littleton | 141 | 3 | 1.7 | Same | 104 | 1 | 0.7 | Same | 114 | 0 | 0 | Same |
| Centura Penrose St Francis Health | Colorado Springs | 414 | 8 | 1.7 | Same | 522 | 3 | 0.5 | Same | 478 | 1 | 0.2 | Same |
| Centura Porter Adventist Hospital | Denver | 514 | 11 | 2.1 | Worse | 574 | 7 | 1.3 | Same | 618 | 5 | 0.9 | Same |
| Centura St Anthony Hospital | Lakewood | 203 | 1 | 0.4 | Same | 145 | 4 | 1.9 | Same | 148 | 2 | 0.8 | Same |
| Centura St Anthony North Hospital | Westminster | 61 | 0 | 0 | Same | 66 | 1 | 1.2 | Same | 103 | 3 | 2.4 | Same |
| Centura St Francis MC | Colorado Springs | 125 | 1 | 0.7 | Same | 117 | 2 | 1.3 | Same | 134 | 2 | 1.3 | Same |
| Centura St Mary Corwin MC | Pueblo | 103 | 2 | 1.5 | Same | 144 | 3 | 1.5 | Same | 124 | 1 | 0.6 | Same |
| Centura St Thomas More Hospital | Canon City | 62 | 4 | 5.2 | Worse | 41 | 2 | 4.3 | Same | 39 | 1 | 2.0 | Same |
| Colorado Plains MC | Fort Morgan | 12 | *** | *** | *** | 25 | 0 | 0 | Same | 32 | 0 | 0 | Same |
| Community Hospital | Grand Junction | 78 | 3 | 2.6 | Same | 79 | 0 | 0 | Same | 62 | 1 | 1.2 | Same |
| Delta County Memorial Hospital | Delta | 57 | 0 | 0 | Same | 62 | 2 | 2.6 | Same | 54 | 1 | 1.4 | Same |
| Denver Health MC | Denver | 99 | 1 | 0.7 | Same | 113 | 2 | 1.1 | Same | 111 | 4 | 1.9 | Same |
| East Morgan County Hospital | Brush | 18 | *** | *** | *** | 9 | *** | *** | *** | 0 | *** | *** | *** |
| Estes Park MC | Estes Park | 0 | *** | *** | *** | 7 | *** | *** | *** | 10 | *** | *** | *** |
| Exempla Good Samaritan MC | Lafayette | 241 | 0 | 0 | Same | 313 | 0 | 0 | Better | 298 | 5 | 1.3 | Same |
| Exempla Lutheran MC | Wheat Ridge | 224 | 5 | 2.1 | Same | 170 | 6 | 2.5 | Same | 160 | 6 | 2.3 | Same |
| Exempla St Joseph Hospital | Denver | 503 | 4 | 0.7 | Same | 705 | 4 | 0.5 | Same | 671 | 4 | 0.5 | Same |
| Family Health West Hospital | Grand Junction | 3 | *** | *** | *** | 2 | *** | *** | *** | 1 | *** | *** | *** |
| Grand River MC | Rifle | 7 | *** | *** | *** | 5 | *** | *** | *** | 10 | *** | *** | *** |
| Gunnison Valley Hospital | Gunnison | 3 | *** | *** | *** | 1 | *** | *** | *** | 6 | *** | *** | *** |
| Heart of the Rockies Regional MC | Salida | 12 | *** | *** | *** | 10 | *** | *** | *** | 21 | 0 | 0 | Same |

| | Surgical Site I | nfections in Hi | p Replaceme | nt Proce | edures in Hospit | als and Ambul | atory Surgery | Centers | Aug. 1, 2010 – | July 31, 2013 | | | |
|---|---------------------|--------------------|--------------------|----------|------------------------|--------------------|--------------------|---------|------------------------|--------------------|---------------------|-----|----------------------------|
| | | | August 2010- | July 20: | 11 | | August 2011- | 2 | August 2012- July 2013 | | | | |
| Health Facility and City | | Procedure Count | Infection Count | SIR | National Comparison | Procedure Count | Infection Count | SIR | National Comparison | Procedure Count | Infectio n Count | SIR | National Compariso n |
| Longmont United Hospital | Longmont | 105 | 1 | 0.6 | Same | 121 | 0 | 0 | Same | 133 | 1 | 0.5 | Same |
| McKee MC | Loveland | 134 | 0 | 0 | Same | 161 | 2 | 1.2 | Same | 149 | 1 | 0.6 | Same |
| MC of Aurora | Aurora | 173 | 3 | 1.5 | Same | 179 | 3 | 1.3 | Same | 259 | 4 | 1.3 | Same |
| MC of the Rockies | Loveland | 84 | 1 | 1.0 | Same | 107 | 0 | 0 | Same | 134 | 4 | 2.5 | Same |
| Memorial Hospital Central | Colorado Springs | 383 | 3 | 0.7 | Same | 308 | 1 | 0.3 | Same | 251 | 1 | 0.4 | Same |
| Memorial Hospital North | Colorado Springs | 97 | 1 | 0.9 | Same | 135 | 1 | 0.8 | Same | 131 | 1 | 0.8 | Same |
| Mercy Regional MC | Durango | 83 | 2 | 2.1 | Same | 94 | 0 | 0 | Same | 75 | 0 | 0 | Same |
| Montrose Memorial Hospital | Montrose | 54 | 1 | 1.4 | Same | 67 | 0 | 0 | Same | 68 | 0 | 0 | Same |
| North Colorado MC | Greeley | 150 | 1 | 0.4 | Same | 146 | 3 | 1.6 | Same | 184 | 0 | 0 | Same |
| North Suburban MC | Thornton | 62 | 0 | 0 | Same | 64 | 0 | 0 | Same | 89 | 1 | 0.8 | Same |
| OrthoColorado Hospital at St. Anthony Medical Campus | Lakewood | 286 | 2 | 0.9 | Same | 387 | 4 | 1.2 | Same | 454 | 1 | 0.2 | Same |
| Orthopedic Center of the Rockies ASC | Ft Collins | 142 | 0 | 0 | Same | 169 | 0 | 0 | Same | 200 | 0 | 0 | Same |
| Parker Adventist Hospital | Parker | 62 | 1 | 1.2 | Same | 103 | 2 | 1.6 | Same | 132 | 2 | 1.0 | Same |
| Parkview MC | Pueblo | 202 | 1 | 0.4 | Same | 208 | 4 | 1.4 | Same | 215 | 2 | 0.6 | Same |
| Pikes Peak Regional Hospital | Woodland Park | 4 | *** | *** | *** | 7 | *** | *** | *** | 4 | *** | *** | *** |
| Platte Valley MC | Brighton | 11 | *** | *** | *** | 10 | *** | *** | *** | 14 | *** | *** | *** |
| Poudre Valley Hospital | Ft Collins | 497 | 2 | 0.4 | Same | 561 | 2 | 0.3 | Same | 481 | 4 | 0.7 | Same |
| Presbyterian St Luke's MC | Denver | 249 | 1 | 0.3 | Same | 321 | 2 | 0.6 | Same | 366 | 2 | 0.5 | Same |
| Rocky Mountain Surgery Center ASC | Englewood | 1 | *** | *** | *** | 1 | *** | *** | *** | 0 | *** | *** | *** |
| Rose MC | Denver | 332 | 0 | 0 | Same | 342 | 3 | 0.8 | Same | 304 | 3 | 1.0 | Same |
| San Luis Valley Regional MC | Alamosa | 21 | 0 | 0 | Same | 26 | 1 | 2.9 | Same | 34 | 0 | 0 | Same |
| Sky Ridge MC | Lone Tree | 442 | 7 | 1.4 | Same | 636 | 8 | 1.2 | Same | 798 | 12 | 1.5 | Same |
| Southwest Memorial Hospital | Cortez | 36 | 0 | 0 | Same | 22 | 1 | 3.7 | Same | 15 | *** | *** | *** |
| St Anthony Summit MC | Frisco | 2 | *** | *** | *** | 1 | *** | *** | *** | 1 | *** | *** | *** |
| St Mary's Hospital | Grand Junction | 259 | 3 | 1.1 | Same | 263 | 0 | 0 | Same | 275 | 1 | 0.3 | Same |
| Sterling Regional MC | Sterling | 40 | 0 | 0 | Same | 36 | 0 | 0 | Same | 30 | 2 | 4.6 | Same |
| Swedish MC | Englewood | 224 | 2 | 0.7 | Same | 280 | 5 | 1.4 | Same | 273 | 1 | 0.3 | Same |
| The Children' Hospital | Aurora | 9 | *** | *** | *** | 33 | 0 | 0 | Same | 19 | *** | *** | *** |
| The Memorial Hospital | Craig | 1 | *** | *** | *** | 7 | *** | *** | *** | 1 | *** | *** | *** |
| University of Colorado Hospital | Aurora | 206 | 6 | 2.8 | Worse | 252 | 1 | 0.3 | Same | 261 | 3 | 0.8 | Same |

| Surgical Site Infections in Hip Replacement Procedures in Hospitals and Ambulatory Surgery Centers: Aug. 1, 2010 – July 31, 2013 | | | | | | | | | | | | | |
|--|------------------------|--------------------|--------------------|-----|------------------------|--------------------|--------------------|------------------------|------------------------|--------------------|---------------------|-----|----------------------------|
| | August 2010- July 2011 | | | | | August 2011- | .2 | August 2012- July 2013 | | | | | |
| Health Facility and City | | Procedure Count | Infection Count | SIR | National Comparison | Procedure Count | Infection Count | SIR | National Comparison | Procedure Count | Infectio n Count | SIR | National Compariso n |
| Vail Valley MC | Vail | 37 | 0 | 0 | Same | 11 | *** | *** | *** | 7 | *** | *** | *** |
| Valley View Hospital | Glenwood Springs | 73 | 0 | 0 | Same | 58 | 0 | 0 | Same | 41 | 0 | 0 | Same |
| Wray Community Hospital | Wray | 6 | *** | *** | *** | 6 | *** | *** | *** | 10 | *** | *** | *** |
| Yampa Valley MC | Steamboat Springs | 47 | 0 | 0 | Same | 74 | 0 | 0 | Same | 58 | 0 | 0 | Same |

Note: MC=Medical Center; SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors. National comparison based on the indirect adjustment of modeled risk factors for each procedure type.

Infections for facilities performing less than 20 procedures per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements. Source: National Health Care Safety Network (NHSN) Database.

^{***} Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of zero.